South Dakota
DEADWOOD FIRE

National Fire Coordination Study

U.S. DEPARTMENT OF AGRICULTURE / FOREST SERVICE / DIVISION OF FIRE CONTROL

DEADWOOD FIRE STUDY REPORT

Black Hills National Forest
South Dakota
1959

ANALYSIS & REPORT

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and

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		Page
I.	INTRODUCTION	1
II.	FIRE DESCRIPTION	3
	A. Location	3
	B. Size and Damage	4
	C. Casualties	5
	D. Fuels, Weather, Topography	5
	E. Control Time	7
	F. Rate of Spread	7
	G. Fire Suppression Forces Employed	8
	H. Agencies and Fire Services	10
	1. Direct Action	10
	2. Support Action	10
	I. Fire Behavior	11
III.	ANALYSIS	12
	A. Sequence of Fire Activity	12
	B. Utilization of Capabilities	15
	1. Independent Actions	15
	2. Mutual Aid	16
	3. Communications	17

Page

C. Fire Suppression Problems 19

1. Organization 19

2. Supply 20

3. Scouting 21

4. Air Attack 21

D. Pre-Disaster Planning 22

1. Prevention 22

2. Training 23

3. Hazard Reduction 23

4. Evacuation 24

5. Utilities 25

6. Civil Defense 25

IV. CONSLUSIONS 28

V. RECOMMENDATIONS 30

VI. APPENDIX 32

I. INTRODUCTION

On September 8, 1959 the Deadwood fire nearly destroyed the town of Deadwood in the Black Hills of South Dakota. (Figure 1) Over 4,500 acres were burned in a pattern that nearly surrounded the town and structure damage on the outskirts of Deadwood totalled nearly $1 million.

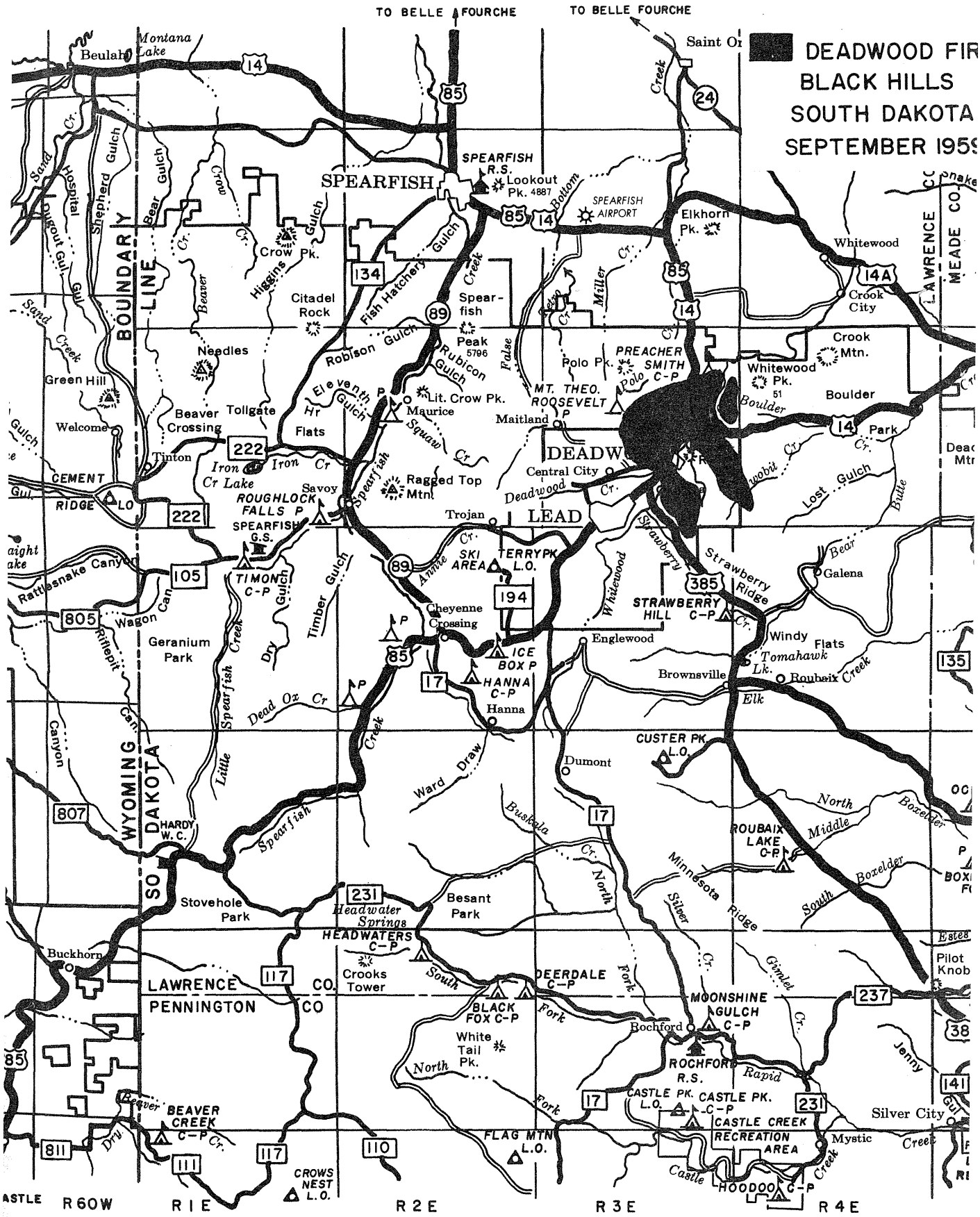
Project 229, National Fire Coordination Study objectives call for specific investigation of selected fires, both current and past, in which there were problems of mutual aid and command. The Deadwood fire was chosen for study because it represents a situation in which several fire-suppression agencies under one command were involved in control of a fire burning both urban and wildlands. (See Exhibit A, Appendix, Conduct of Study) The town was evacuated ahead of the fire, and two other wildfires occurring simultaneously with the Deadwood fire made the situation even more critical from the standpoint of available firefighting resources.

The fire started during a period of extreme fire weather and twice threatened the town -- once during the initial run, and again with the passage of a dry cold frontal system that caused winds to shift, driving the fire back towards the small community.

In the area to the northwest of Deadwood where the fire made its original run, there was nearly 100% kill of the 80-90 year old ponderosa pine timber. Scattered tracts of timber were missed by the fire on the remainder of the area, and over $53,000 in Emergency Flood Control money was expended for emergency treatment and watershed rehabilitation.

FIGURE 1

Deadwood Fire, Black Hills National Forest, South Dakota


DEADWOOD FIR
BLACK HILLS
SOUTH DAKOTA
SEPTEMBER 195
TO BELLE FOURCHE
TO BELLE FOURCHE
Saint Or
Beulah
Montana Lake
SPEARFISH
SPEARFISH R.S.
Lookout Pk. 4887
SPEARFISH AIRPORT
Elkhorn Pk.
Whitewood
Crook City
Crook Mtn.
Whitewood Pk.
Boulder
Park
BOUNDARY LINE
LAWRENCE
MEADE CO
Crow Pk.
Citadel Rock
Needles
Green Hill
Welcome
Beaver Crossing
Tollgate
Flats
Tinton
Iron Cr
Iron Cr Lake
CEMENT RIDGE LO
ROUGHLOCK FALLS P
Savoy
SPEARFISH G.S.
Spear-fish
Peak 5796
Ragged Top Mtn.
Lit. Crow Pk.
Maurice
Maitland
Polo Pk.
PREACHER SMITH C-P
MT. THEO. ROOSEVELT
Central City
DEADW
Trojan
LEAD
Deadwood
SKI AREA
TERRY PK L.O.
TIMON C-P
Cheyenne Crossing
ICE BOX P
HANNA C-P
Hanna
Englewood
STRAWBERRY HILL C-P
Strawberry Ridge
Galena
Windy Flats
Tomahawk Lk.
Roubaix Creek
Brownsville
Elk
CUSTER PK L.O.
Dumont
Ward Draw
Dead Ox Cr
Rattlesnake Canyon
Wagon Can
Rifle Pit Can
Canyon
Geranium Park
Dry Gulch
Timber Gulch
Spearfish Creek
Little Spearfish Creek
WYOMING
DAKOTA
SO
HARDY W.C.
Stovehole Park
Besant Park
Headwater Springs
HEADWATERS C-P
Crooks Tower
Buckhorn
LAWRENCE CO.
PENNINGTON CO
DEERDALE C-P
BLACK FOX C-P
White Tail Pk.
MOONSHINE GULCH C-P
Rochford
ROCHFORD R.S.
Rapid
CASTLE PK. L.O.
CASTLE PK. C-P
CASTLE CREEK RECREATION AREA
Silver City
Mystic
FLAG MTN L.O.
HOODOO C-P
BEAVER CREEK C-P
CROWS NEST L.O.
ROUBAIX LAKE C-P
Pilot Knob
Minnesota Ridge
Silver
Girdle
Jenny
Bushala Cr
North Fork
South Fork
Middle Boxelder
North Boxelder
South Boxelder
Estes
Sand Creek
Hospital Gulch
Outcut Gul
Shepherd Gulch
Bear Gulch
Crow Cr
Beaver Cr
Higgins Gulch
Fish Hatchery Gulch
Robison Gulch
Rubicon Gulch
Eleventh Hr Gulch
Squaw Cr
Miller Cr
False Cr
Annie Cr
Whitewood Cr
Strawberry Cr
Bear Cr
Lost Gulch
Rabbit Cr
Butte Creek
Castle Creek
Jenny Gulch
Dry Cr
Beaver Cr
Deadwood Cr
Bottom Cr
Elkhorn Cr
Tepee Cr
Creek
Gulch
Ridge
Canyon
Cr
Fork
Rapid
Creek
Gulch
Park
Mtn
Pk
Lk
Cr
Gul
Can
Ridge
Flats
Draw
Canyon
Creek
Fork
Rapid

II. FIRE DESCRIPTION

A copy of the official Fire Report, FS 929, is included as Exhibit C of the Appendix. A more-detailed description of the fire is included in this section.

A. Location: The Black Hills region of South Dakota is perhaps best known for its recreational opportunities, but the region is an equally-important producer of timber and mine products, particularly gold. The town of Deadwood is located in the north end of the Black Hills, 41 miles NW of Rapid City. The population of Deadwood is nearly 3,500, but there are nearly 10,000 people living within a five-mile radius of Deadwood. Lead, South Dakota, only three miles away, has a population of nearly 6,000 people, and is the location of the famous Homestake Gold Mine, largest single producer of gold in the Western Hemisphere.

The Deadwood fire started in the backyard of the Hillcrest Manor, a rest home located in the mouth of a canyon on the road between Central City and Deadwood. (Legal description: NWNW, Sec. 28, T5N, R3E, Black Hills Meridian) Homes and improvements are scattered throughout the hills and canyons, and timber slopes extend from ridgetops into the canyon bottoms.

B. Size and Damage: A total of 4,501 acres were burned on the Deadwood fire. Landownership of the burned area is as follows:

Ownership	Acres Burned
National Forest Land	975
Private lands inside NF boundary	896
Private lands outside NF boundary	1,664
Other public lands (BLM)	966
Total	4,501

Deadwood and the adjacent community suffered extensive losses and damage from the fire. The town of Deadwood was not destroyed, but fire did burn within the city limits. Total damages were approximately $1,558,000. Of this, damage to structural improvements totalled nearly $1 million and includes among other items:

Two Forest Products Plants	$ 572,000
Other Business Establishments	59,000
Public Utilities (lines and poles)	51,000
Residences	120,000
Other Buildings and Improvements	87,000
Total	$ 889,000

Fire Suppression costs exceeded $280,000 and includes $166,000 paid to firefighters and overhead; $30,000 for air tanker operation; $40,000 for food; and $49,000 for equipment use. Resource Damage, or damage to timber, wildlife, recreation and watershed values, was established at $653,000. Indirect Losses include: personal payroll losses, personal property losses, and personal expenses during the 36-hour evacuation period.

C. Casualties: There were serious injuries, but no casualties on this fire, although several minor accidents did occur. Two dozer operators were burned when fire overran them while they were working. A crew of men were temporarily trapped, but were led to safety by a helicopter. Power lines were down, and were threatening to the safety of firefighters until the power was cut off.

D. Fuels, Topography, and Weather: The natural fuels around the Deadwood area are predominantly young stands of ponderosa pine, 70-100 years old, mostly unthinned. Some Forest Service land had been thinned, but there was little slash fuel on the ground. Light, surface fuels, such as grass and needles, are usually abundant under the Black Hills pine stands. This flash fuel provided the "wick" that extended the fire from source to tree crowns in a matter of minutes.

The terrain surrounding Deadwood is characterized by rough ridges and valleys with frequent rock bluffs. Elevation in the burned area ranged from 4,600 feet at Deadwood to 5,600 feet on the ridge top at the north end of the fire. Slopes vary from 10% to 65%, with an average of about 30%. Steep canyons and draws cut the area from all directions, making fire suppression difficult and dangerous.

Fire weather prior to the Deadwood fire had been critical since mid-August. (Exhibit D, Appendix) On the day of the fire, the noon relative humidity was 11% as measured at the Nemo Ranger Station, 11 miles SE of Deadwood. Wind was SW at 20-25 miles per hour. The air temperature 96° and the Drought Index was 95 as computed by the Region 2 Fire Danger Meter. The weather influencing the fire during the first two hours was critical enough to make direct action impossible. To make matters worse, a special fire weather forecast called for a classical cold front passage through the area between 2:30 and 4:00 pm, with the usual accompanying shift in wind direction and velocities increasing to 30-40 mph. Humidity would remain about the same, and temperatures would be slightly cooler. The frontal passage actually occurred at around 3:30 pm, and with it came a 90° change in wind direction. This produced an even more serious threat to the town of Deadwood as this shift in wind direction and

the accompanying increase in velocity caused the fire to change directions and flank Deadwood on the NW and SW, nearly surrounding the town by fire.

On the evening of September 8, the skies were clear and the temperature dropped to a low of 26° -- a real aid to night fire suppression activities.

E. Control Time: The Deadwood fire started at 1:00 pm, on September 8, 1959, and the final perimeter was reached about 7 hours later. There was holding action throughout the following day, September 9, but only burnout of hot spots occurred, and there was no change in perimeter.

F. Rate of Fire Spread: There were reports of some extreme rates of fire spread during the early stages of the fire. We know the fire travelled from ignition point to U. S. Highway 385, on the NW edge of Deadwood in 1 hour and 20 minutes -- a distance of 2 1/2 miles. There were no reliable rate of spread estimates when the fire changed directions with the cold front passage, but there appeared to be an overall decrease, even though the wind velocity increased. Patches of unburned material were left and this caused control problems the following day.

G. Fire suppression forces employed: Available records do not indicate an exact inventory of men and equipment during the periods of peak mobilization. It was estimated that over 1,000 men were on the fire within the first hour and nearly 3,600 volunteer and regular firefighters were working on the fire by sundown on the day the fire started. Twenty-seven bulldozers, and 50 tankers were on the fire by 8:00 pm that evening. Four air tankers were used on the fire, and ground tanker units from the surrounding city and county fire departments were on the fire soon after it was discovered.

The Homstake Mining operation at Lead provided the largest number of organized crews. They were able to place nearly 100 men equipped with hand tools on the fire within minutes after the fire started. Production of the mine, mill, and slime plant was shut down and the entire force sent to the fire area, providing a labor source of nearly 2,000 trained men with overhead --(and, incidentally, resulting in a substantial loss to the company due to shut down). Crews totalling nearly 400 were sent from Ellsworth Air Force Base near Rapid City and were on the fire the evening of the first day. Additional military reinforcements were provided during the days to follow. The Air Base also sent a hospital unit and three pieces of fire suppression equipment.

National Guard units from Rapid City, Sturgis, Belle Fourche, Deadwood, and Lead, were activated immediately and provided tractors, tankers, gasoline, trucks, pumpers, and hand tools. Wyoming National Guard units near the area were alerted, but not called.

About 35 state patrolmen and local law officers arrived to assist local authorities in handling traffic and security matters.

Air attack by Forest Service and contract planes delivered 111,500 gallons of slurry at a cost of $27,125. This use of aircraft, mentioned later, was started on the morning of the second day, and represented the first real all-out effort to use air attack on Black Hills fires.

The services mentioned above are in addition to the regular firefighting crews from city fire departments, state rural fire defense crews, and U. S. Forest Service personnel.

H. Agencies and Fire Services: The following groups provided both men and equipment for direct action on the fire:

Homestake Mining Company from Lead, Spearfish, S. D.

U. S. F. S., Regions 1 and 2: Black Hills, Big Horn, Arapache, and Medicine Bow National Forests, and Smokejumpers from R-1

South Dakota Department of Game, Fish and Parks; Custer State Park, State Forestry Department

National Guard (seven units) men and equipment

Ellsworth Air Force Base

Rural Fire Departments

Lawrence County Road Maintenance

Indian Crews; Crow, Cheyenne, Pine Ridge, Oglala, and Black Foot

Supporting action was provided by the following -- and quite likely other organizations not mentioned:

NW Bell Telephone

Black Hills Power and Light

Black Hills Association of Red Cross Chapters

State Department of Public Health

American Legion and VFW Posts

Sheriff and Police from surrounding communities

State and local office of Civil Defense

I. Fire Behavior: There were actually two types of fires involved in the one Deadwood fire incident. The first fire was an intense, running crown fire, burning under conditions of high temperatures, low humidities, and strong prevailing winds. This fire burned clear and was so intense that direct attack was impossible. (Figure 2) With the passage of the cold front, the character of the fire changed. The wind shifted 90° from SW to NW and remained at about the same velocity (30 mph). Temperatures dropped. With this change, the fire moved in two heads toward the SE, flanking the town of Deadwood on the NE and SW. (See Figure 3) The fire was equally intense for a short while but began leaving islands of unburned fuel as the moisture content of surface fuels began to increase.

Even the wind shift with the cold front passage was not what made this fire unique -- it was the fact that twice it came so close to destroying the town of Deadwood; once when it passed to the NW of the town during the initial run and again when it flanked the town on the NE and SW.

FIGURE 2

FIGURE 3

Figure 2 - View of the Deadwood fire looking north at about 3:00 p.m. on September 8, 1959 just before passage of the cold front. This portion of the fire destroyed nearly 100% of the timber in its path and burned to the edge of Deadwood on the NW side of town.

With the cold front passage at about 3:30 p.m. the fire crossed the valley to the NE and SW of Deadwood burning forest products plants at both these crossings; burned over the approximate areas shown by the dotted line.

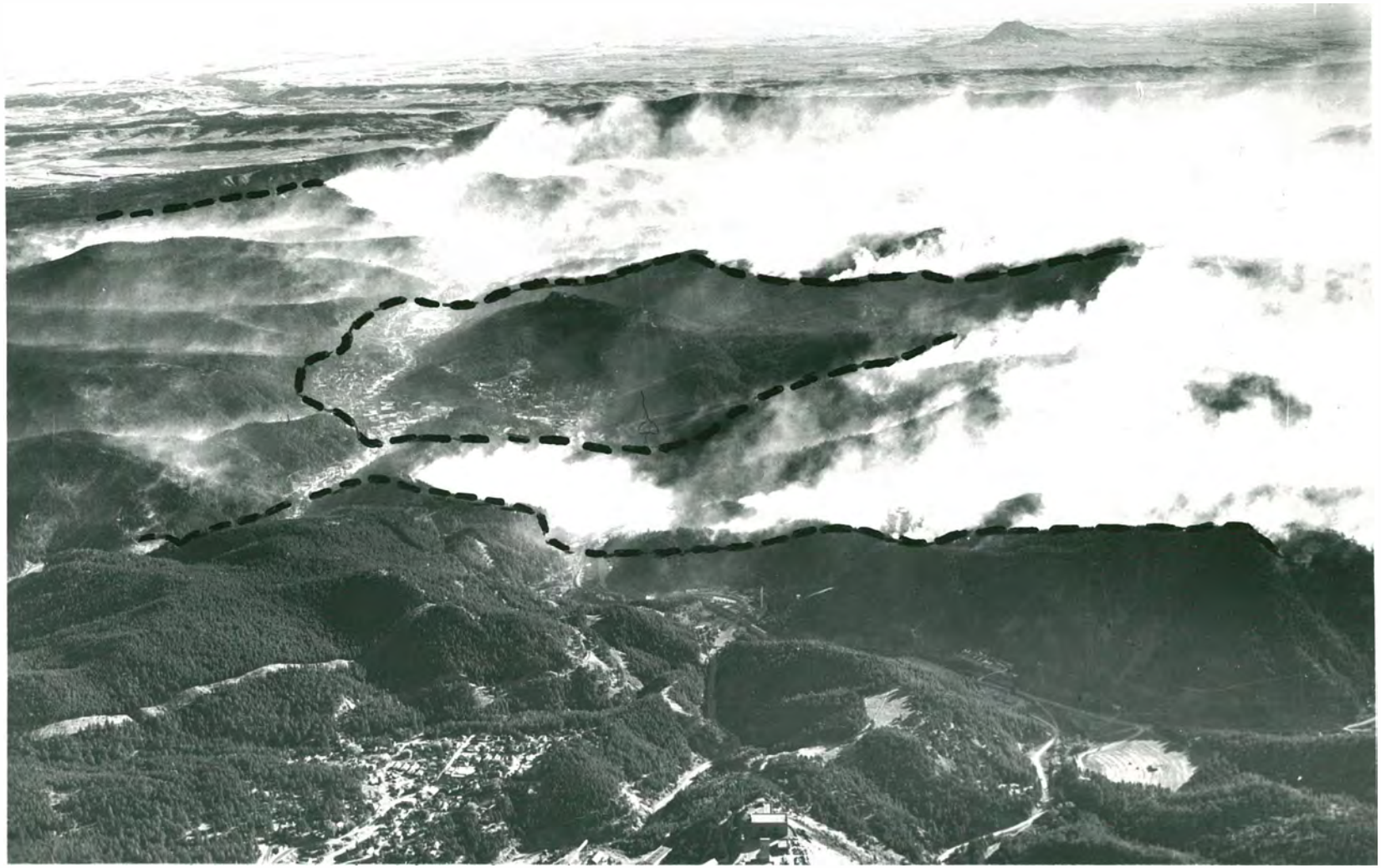


Figure 3 - View of Deadwood fire looking northeast at about 9:00 a.m. on September 9th. Lead, South Dakota is in the foreground. Air temperature at the time of this photo was approximately 50° cooler than when Figure 1 was taken. Wind velocity was still strong but the cool air aided fire suppression activities. A portion of the fire perimeter is shown by the dotted line. Note the unburned area in the center of the area which is southeast of Deadwood.

III. ANALYSIS

As a result of the Deadwood fire, Lawrence County was declared a disaster area by the Small Business Administration. Damage was of such extent to warrant this special emergency program.

A. Sequence of Fire Activity: The Deadwood fire started at 1:10 p.m., on September 8, 1959, near a trash barrel at the rear of private rest home. Debris burning was the cause. The ignition point was in the mouth of a canyon about 1/2 mile from the SW corner of the town of Deadwood. The fire burned from private land to BLM land to Forest Service land in the first 30 minutes. (See map of fire)

Initial attack was made by a County Highway Department worker and minutes later the Central City, Lead, and Deadwood Fire Departments arrived -- just as the fire was going up the grass slope into the woods. By 1:18 pm the fire was well up the slope into the timber and crowning. The following Forest Service log of early fire activity has been abbreviated, but will serve to demonstrate mobilization:

1:25 pm National Forest Supervisor's Office in Custer notified to dispatch overhead for project fire.

1:32 pm Lead National Guard unit with dozer working on the fire at the SW corner of town.

1:40 pm Helitack crew and copter to fire.

1:45 pm An estimated 2,000 men, 3 dozers, several pumpers were on the fire - all taking independent action. Another 1,000 on the way and 500 military on standby.

1:55 pm Slurry planes ordered from Greybull, Wyoming, and Missoula, Montana (not used this day)

2:00 pm Limestone District Ranger set up fire headquarters in parking lot across from Franklin Hotel. Began to organize crews coming in.

2:16 pm Evacuation of town started by state and county officials.

2:30 pm Fire crossed U. S. Highway 385 to NW of Deadwood on 1/2 mile front blocking the Highway and burning some homes and a motel in the area.

3:25 pm Cold front passing Terry Peak with shifting winds. Deadwood again threatened along the entire NW side, but line constructed by independent action held and the fire only flanked the town.

With the passage of the cold front at about 3:30 pm, the fire changed directions, spotted across the valley in two locations, (NE & SW) and flanked Deadwood with two head fires going up timbered slopes. Control was achieved during the night by flanking action on the two separate head fires after the fires had cooled down.

Scouting was dangerous and difficult due to the two heads and the volume of smoke that had settled in the canyons.

There was holding action for the next two days and weather was favorable for hot-spotting and mop-up. Fire declared out on September 15.

> Note: It is important to recall here that at 3:00 pm, another fire started just 13 miles, airline, SE of Deadwood. The Nemo fire was started when high winds blew a tree across a power line. Fire danger was extreme and the fire burned 273 acres of Federal and private land before being controlled 11 hours later.
>
> At 5:20 pm, another fire, the Buckhorn fire, started several miles away and it too was a potential project fire.

By late evening there were 500 men and 11 dozers on the Nemo fire and probably 30 men and 2 dozers on the Buckhorn fire.

This additional fire action was handled separately from the Deadwood fire through the central dispatching office in Custer. When the Nemo and Buckhorn fires started, the dispatcher began handling a multiple fire situation. As a result of these new fires, men, equipment, and overhead had to be distributed to develop a fire suppression organization consistent with the current fire need and fire potential. This meant simply that the dispatcher could no longer "throw everything" at the Deadwood fire, but rather had to distribute available resources to the fires where they were needed the most.

B. Utilization of Capabilities

1. Independent action: Independent action, in addition to organized crew effort on the part of miners, National Guard, citizens, fire departments, Forest Service, and others helped to prevent Deadwood from being overrun by fire during the first two hours. When the wind shifted, there were enough firefighters, and enough effective line had been constructed to keep the fire out of the main part of the city. Farmers and ranchers delivered water in tanks of various descriptions to assist the suppression effort.

Independent action by a law enforcement individual directing traffic resulted in some equipment being sent into an area where it wasn't needed.

2. Mutual Aid: An area of approximately 23,000 acres surrounding Deadwood is an exclusion from, but entirely surrounded by, the Black Hills National Forest. This exclusion is known as the "Exemption Area". Private mining claims and claims on BLM land within the "Exemption Area" create a complicated ownership pattern. The Forest Service assumes fire protection responsibilities with the "Exemption Area" under the terms of a cooperative agreement with Lawrence County, the cities of Deadwood and Lead, the Homestake Mine, Bald Mountain Mining Company, and the Golden Reward Mining Company. Protection is provided by the Forest Service on a fee basis, which is adjusted annually by computing fire protection costs for the previous fire years. The five-year average is used as a basis for pre-acre assessment. (See Exhibit E, and F, Appendix: 1955 and 1963 Exemption Area Cooperative Agreement)

The fire chief's of Deadwood stated that they have complete mutual aid without a formal written agreement. However, the cooperative agreement for the Exemption Area provides formal written coverage for some of the arrangements that are in effect. The only thing that may limit mutual aid from some of the village fire departments, is the need to maintain at least a skeleton crew to protect local property.

There was a brief period during the afternoon of the first day when mutual aid was on shaky ground. An undetermined number of men from the Homestake Mine left Deadwood and returned to Lead because they had heard that the town of Lead was threatened. This was probably immediately after the wind had shifted with passage of the cold front. The men returned to Deadwood when they determined that the rumor was false. We were unable to determine what effect this brief fracture of mutual aid relations had on control of the fire.

3. Communications: Communications on this fire were better than average. Soon after the fire headquarters was established, the Forest Service set up a radio main station in the office adjacent to the radio command set in the Sheriff's office. With this arrangement, the Forest Service was able to maintain close liaison with State Forestry crews,

State Patrol, local police, highway maintenance crews, and rural fire departments. All radio communications were on these two frequencies with the exception of a few sets operated by the Homestake Mining Company and some sets brought in by the Civil Defense. Terry Peak was used as a relay point for situations where direct contact was needed between fire headquarters and the line organization.

A breakdown in communications occurred when a Division Boss, ordering equipment from fire headquarters failed to have his orders filled because a Highway Patrolman on duty directing traffic kept putting the equipment to work on a portion of the fire where it wasn't really needed. Better communications with the Division Boss would have prevented this unwelcome effort of independent action.

It was surprising to learn that the Deadwood Fire Department had no radio equipment available. This was a severe handicap. The department is in the process of obtaining some citizens band sets that will serve a very local need, but will not be effective outside of a rather short range. Most of the city fire departments in the area have some radio communications. Deadwood was the exception.

C. Fire Suppression Problems

1. Organization: The rapid buildup of volunteer firefighters made it nearly impossible to assemble trained overhead or supervisory personnel rapidly enough to meet current needs. As a result, a number of local firefighters went directly to work on the fire without adequate supervision and screening. This situation developed because additional overhead had to be called in from surrounding Ranger Districts; while most of the volunteers that were on the fire in the first hour probably lived within a 3-mile radius of Deadwood. Once the overhead was available, the standard large fire organization was put into effect, using five divisions to cover the perimeter. There were three divisions with Forest Service overhead, and two divisions manned by Homestake Mining Company crews.

A Fire Cooperative Agreement between Homestake Mining Co. and the Black Hills National Forest (Exhibit H, Appendix) provides for clear recognition of authority when fire emergencies reach a certain level. By this agreement an individual, and one or more alternates, is appointed by April 1 of each year, by agency representatives, to be in charge of suppression activities on large fires involving lands of mixed ownership. This person will have command when initial attack fails and 200 or more firefighters are employed.

In spite of this agreement, some difficulty developed on this fire when personnel from the National Guard, Fire Departments, and Homestake Mining Company failed to recognize the central command and were assigning and releasing crews without approval from fire headquarters. This difficulty was resolved through a meeting with overhead from these organizations.

When the National Guard in Lead and Deadwood were activated, many of the Guard members were already at work on the fire. We were unable to determine how many of these men remained with their original crews and how many joined with National Guard crews to fight the fire.

2. Supply: There was a shortage of transportation for personnel during the afternoon. This was solved with help from the National Guard, Homestake Mine, and Air Force.

Hand tools were in short supply but this situation was relieved somewhat by firefighters using their personal tools. The 100-man tool cache in Deadwood was gone in minutes.

Equipment rental agreements were not completed until Wednesday on much of the equipment pressed into use. This has been solved by signing up equipment before fire emergencies occur.

3. Scouting: Inadequate scouting reports during late afternoon and evening made control difficult on the SE portion of the fire. There were two reasons for this: (1) The smoke was so thick due to the temperature inversion that developed in the canyons, that air reconnaissance, even with helicopters, was considered impractical and even ground scouting uncertain. (2) With the many spots of unburned fuel within the burn it was difficult to tell just where the line was and sending men in ahead of the fire on the ground was too risky. The Division on the SE portion of the fire had difficulty in deciding whether to control the fire as two separate heads, or build a line across the front, connecting the two fire heads.

4. Air Attack: A great deal has been learned since this fire about how and where to use air attack on wildfires. The evaluation made at that time of the effectiveness of air attack on this fire, indicated satisfaction by those observing the results. (Air Operations Report, Exhibit I, Appendix)

At about 9:30 in the morning of the second day, two aircraft flying out of Spearfish Airport began making drops on the fire. These were independent action drops since there was no radio ground control. Later, a system was worked out using the helicopter to control where the drops were to be made. Since

most of the fire perimeter was controlled when the air attack started, the majority of the drops were made on flareups inside the line that were threatening control. The flareups were in pockets of unburned fuel that were not consumed by the fire in the original run.

Unauthorized plane travel over the Deadwood fire made air attack hazardous. It was necessary for the Governor to call all surrounding airports and have air use restricted to all but official planes. Local radio also helped to clear the fire area of airplanes so that air operations could proceed safely.

D. Pre-Disaster Planning

1. Prevention: A strong fire prevention program is an important part of fire pre-suppression planning in the Black Hills. When the Deadwood fire occurred, there was a local fire prevention guard on duty making personal contacts and patrolling within the Exemption Area. The salary for this individual is paid for by fees collected under terms of the Exemption Area Cooperative Agreement. This arrangement works well and probably is more effective in reducing fire occurrence than utilizing outside personnel only during periods of high fire danger.

2. Training: The amont of training and level of competence in handling fire situations have no doubt increased and improved since the Deadwood fire. Fire agencies currently train together and cooperators, wardens, and volunteer fire chiefs are invited to annual fire sessions held on National Forest Ranger Districts. The State Forestry organizations each year has a training session that covers communications, use of new equipment, and more effective use of present equipment.

3. Hazard Reduction: The Deadwood fire brought about some marked changes in attitude concerning the need to reduce concentrations to natural fuels in the vicinity around Deadwood and Lead. Most significant is the effort by Homestake Mining Company at Lead to remove the trees that were encroaching on the mine buildings and other improvements associated with the mine. This provided an area cleared of trees and heavy fuel so that fire protection would be made easier. In addition to this project, a major effort was made to increase the measure of protection for home owners living adjacent to wooded areas. The company undertook a thinning project on the West, North, and Northeast sides of town, in which the heavy stands of trees were thinned and the slash disposed of. The purpose of this work was to eliminate the tree crown canopy extending right up to the edge of town. Providing space between trees that will make the destructive crown fire less likely.

4. Evacuation: Neither available records nor interviews yielded specific information concerning who gave the first orders to begin evacuation of the town. Assistant Fire Chief Coburn acting in the absence of the regular Fire Chief returned from a look at the fire at approximately 1:30 pm and informed the Mayor of the fire situation. They agreed that the Mayor should send out the word to dismiss the schools and for the children to go to their homes. Plans were also underway, under direction of the Deputy Sheriff to begin evacuation of the hospital and rest homes. By 2:00 pm, most of the business establishments were closed and the evacuation traffic was moving out of Deadwood. Announcement to evacuate came over local radio and by word of mouth. Most of the people that were going to leave were gone by the time the fire changed direction and made the second threat on the town. The move was orderly and accomplished in 30-45 minutes.

It was fortunate that the evacuation was virtually completed by the time the wind shift came, because for a short period of time, all exists were cut off as the fire burned across the road at the NE and SE edge of town.

Law enforcement units from surrounding towns helped patrol the streets, and prevent looting. No difficulty was experienced here.

5. Utilities: The power company and telephone company responded to the critical need to maintain both lights and communication by keeping a constant watch for trouble. At about 9:00 pm, the power went off in Deadwood when the fire destroyed some power poles but service was restored in a short time. The telephone company had similar troubles but were able to maintain nearly continuous service throughout the fire. These crews had apparently been well trained to handle critical situations and their service was excellent.

6. Civil Defense: There were a number of references to Civil Defense activities on this fire as well as on some more recent fires. In essence, it was felt that the Civil Defense activities were out of step with the rest of the suppression and emergency organization. The Sheriff of Deadwood was the local CD coordinator but was so involved in the law enforcement duties that he wasn't able to act in CD capacity.

There was a substantial amount of Civil Defense equipment moved into the area without any request coming from the fire command center. Camp equipment, radios that were not tied in with those on the fire, lighting systems, mess equipment, heavy equipment, and trucks for firefighting,

were brought in. Apparently, much of this equipment was used ineffectively because there was no coordination of needs and availability.

Another instance on another fire, was cited where CD officials issued unauthorized calls for volunteer firefighters and the suppression agency was swamped with applicants to work on a fire when they weren't really needed.

We were unable to determine how many individuals were working strictly in a Civil Defense capacity on this fire. It appears likely that many individuals were working in a "Two Hat" capacity -- like the Deadwood Sheriff who handled mostly law enforcement but perhaps acted in a Civil Defense position in supervising evacuation.

In general, the fire suppression agencies seem to resent the intrusion or presence of local and state CD personnel -- even though the intentions of CD are the very best. This is not a healthy situation and needs immediate attention. On a fire of this magnitude Civil Defense efforts are definitely needed and should be more closely coordinated with the responsible suppression agency. Perhaps the CD organization functioned efficiently in more areas than we were able to determine from reports and interviews. For example, a newspaper clipping read as follows:

"State Civil Defense Director Brig. Gen. Homes Jensen commended CD workers and firefighters for handling the fire emergency. Nearly 4,000 people were evacuated from the town in less than 30 minutes. No trouble experienced. Sheriff McGrath, Lawrence County Civil Defense Director - said 'Many of our people have felt that CD is not needed because this area would never receive a bomb, but I think that this definitely proves it is vital.' Hospital and staff of Deadwood Hospital evacuated in 42 minutes."

Probably as a part of the Civil Defense effort it was reported that the Black Hills Association of Red Cross Chapters treated and released 26 persons during the fire emergency -- handled local and long distance calls and inquiries and arranged for housing for many of the evacuees. They also served food in many areas.

IV CONCLUSIONS

From the analysis of the Deadwood Fire, we can conclude or assume the following:

A. Independent action by individuals familiar with the use of hand tools and mechanical equipment was reasonably effective in accomplishing short-term, specific objectives.

B. Independent action, though sometimes effective, is also dangerous if not directed or coordinated.

C. Fire suppression was made more difficult because of inadequate scouting and intelligence.

D. As a result of the Deadwood Fire the Homestake Mining Company took action to reduce the fire hazard around the town of Lead and the mine installations.

E. Evacuation of small communities can be accomplished in an orderly manner during periods of stress.

F. Utility crews were effective in handling the emergencies that were produced as a result of the Deadwood Fire.

G. Central command was established within the first two hours but recognition of this central command was not complete. Even after several hours, crews were moved independently without consent from fire headquarters.

H. The wearing of "Two Hats" by public officials during emergency situations often means that one responsibility suffers while administering the other.

I. Civil Defense equipment and supplies were not adequately tied into local command.

J. Fire suppression efforts by the Forest Service within the Exemption Area are supported by a fee system. This appears to be a workable arrangement.

K. Air attack was more effective when pilots were given specific instructions on where to drop.

L. Unauthorized aircraft flying around the fire created hazards to aerial fire suppression activities.

M. We assume that the existing mine supervisory organization acted as overhead for some of the independent action and were moderately successful in handling these initial attack crews.

N. Communications, were generally good but some lack of co-ordination occurred because of communication gaps.

V. RECOMMENDATIONS

These recommendations are concerned with problems, that if solved, would increase effectiveness and contribute toward a nationally coordinated fire system.

A. Continue to work with, and train, local individuals to act as temporary or permanent fire overhead.

B. Inventory available personnel that are working in organized labor, and have the stamina and training to work effectively in fire control.

C. Include a description of who is responsible for what phase of situation scouting in disaster planning.

D. Design an effective way to gather information about the fire situation following a disaster. Project Fire Scan is likely to be an important part of this.

E. Design an interagency communications system that will help achieve a unified central command rapidly following a disaster.

F. Coordinate Civil Defense and fire services so that fire defense utilizes the capabilities of both during a disaster.

G. Study the possibilities of effective use of aerial delivery of fire retardants in urban conflagration.

H. Develop ways to control unauthorized aircraft in disaster areas.

I. Include representatives from law enforcement agencies in the annual pre-disaster planning and joint training meetings to coordinate their activities with emergency efforts.

These recommendations are concerned with strong points that could be adapted to an effective nationally coordinated fire system.

A. Design ways to train or otherwise build upon the capabilities of individuals to act independently to suppress fires -- while at the same time recognizing the need for a central command to eventually control the disaster.

B. Plan and carry out fuel reduction projects in situations where communities are bordered by hazardous rural fuels. This is especially important in nuclear target areas.

C. Organize and train selected individuals (civilian, public) so they can assemble and effectively lead small fire crews following a disaster.

VI APPENDIX

Exhibit A

Conduct of Study

Exhibit B

Individuals Interviewed

Exhibit C

Individual Fire Report

Exhibit D

Fire Weather Records

Exhibit E

1955 Exemption Area Cooperative Agreement, Black Hills, Lawrence County. (In effect at time of fire)

Exhibit F

1963 Exemption Area Cooperative Agreement, Black Hills, Lawrence County. (Presently in effect)

Exhibit G

Region 2, Forest Service Handbook, Supplement No. 23, Jul. 1959
Cooperative Forest Fire Protection Agreement between State of South Dakota Department of Game, Fish, and Parks, National Park Service, and U. S. Forest Service

Exhibit H

Black Hills National Forest, Forest Service Handbook Supplement No. 3, July 1959
Fire Cooperative Agreement between Homestake Mining Company and U. S. Forest Service, with 1951 and 1956 modifications to agreement.

Exhibit I

Documents and records not included in body of this report but on file at the Division of Fire Control, National Fire Coordination Study, Washington, D. C.

Exhibit A

CONDUCT OF STUDY

Exhibit A

CONDUCT OF STUDY

The Deadwood, South Dakota fire of 1959 provided an opportunity to study a past fire situation in which valuable property and forest land was destroyed, a community was seriously threatened with destruction, and the fire suppression action was handled by a number of suppression agencies operating under the terms of established cooperative agreements.

The study was conducted by a team of two analysts that combined a complete review of the pertinent file material with a series of interviews with key individuals, and a visit to the site of the fire. John H. Dieterich, Fire Analyst, with OCD Project 229, was assisted in the study by Chief Dave Gratz, Silver Spring, Maryland Volunteer Fire Department, acting as Special Consultant to Project 229. Record material from the Forest Service Regional Office in Denver, and Black Hills Forest Supervisor's Office in Custer, South Dakota, and personal files of individuals working on the fire were made available for the study, as well as portions of personal files of some of the individuals that were interviewed.

The Deadwood Fire is a rather famous fire in recent Rocky Mountain fire history and as a result is well-documented in reports and accounts of fire action prepared by agencies involved and other interested individuals. The fire received rather extensive coverage by "Life" Magazine, and at the time received nationwide coverage when the small community became nearly surrounded by fire. While many of the records and reports yield minor conflicting accounts, and inconsistencies most of the material reviewed by the analysts is in good general agreement concerning direct action on the fire, time sequence of events, and utilization of suppression forces. The review and analysis of available records provides a store of factual information that is not always available through interviews -- especially when a number of years have passed since the actual fire experience. Interviews provide impressions of past action and reveal certain parts of the overall fire suppression job. Because of the time element, there is not always complete agreement between interviewees on a particular item.

Exhibit B

INDIVIDUALS INTERVIEWED

Exhibit B

INDIVIDUALS INTERVIEWED

Name	Position During Fire	Present Position
Howard C. Lee	Supervisor, FS Black Hills NF	Chief Operations, R-2, Denver, Colo.
Warren W. Walters	District Ranger, FS (Div. Boss)	Rec. Planning, R-2 Denver, Colorado
Leslie E. Hendry	District Ranger, FS (Div. Boss)	Info. & Educ., R-2 Denver, Colorado
Kenneth C. Scholz	Fire Staff, FS Black Hills NF	Supervisor, White River NF, Glenwood Springs
Harry P. Gaylor	Fire Control, FS, R-2, Denver	Fire Control, R-2 Denver, Colorado
Miles Hill	Timber Staff, FS, Black Hills (Fire Boss)	Timber Management R-2, Denver, Colo.
Ben Mahoney	Dispatcher, FS Black Hills NF	Dispatcher, Black Hills, NF, Custer, S.D.
Richard McGrath	Sheriff, Lawrence Co., Deadwood	Sheriff, Lawrence Co.
Chief A. A. Coburn	Assistant Fire Chief, Deadwood	Fire Chief, Deadwood, South Dakota

Exhibit C

INDIVIDUAL FIRE REPORT

Exhibit C

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

INDIVIDUAL FIRE REPORT
(All classes of fires)

5180
Ranger fire No. 13

Region fire No. .....

ITEM		CODE NO.	COL. NO.
1. Name of fire	Deadwood	XXXX	XXX
2. Ranger district	Nemo	8	1
3. Forest	Black Hills	18	2-3
4. Region		2	4
5. State	South Dakota	5	5
6. County	Lawrence	XXXX	XXX
7. Supervisor's fire number		181	6-8
8. Year discovered		9	9
9. Month discovered		9	10
10. Day discovered		08	11-12
11. FF cost class ($ 300,000.00 (Approx. FF Cost))		0	13
12. Size class (E)		5	14
13. General cause	Debris Burning	6	15
14. Specific cause	Rubbish Disposal	31	16-17
15. Class of people	Other	TT	18-19
16. Fire started on	Outside Protected	3	20

ELAPSED TIME	DATE	HOUR	A. M. P. M.	ELAPSED TIME Hours	ELAPSED TIME Min.	COL. NO.
17. Origin: Guess ____ Known X	9/8	1310		XX	2	XXX 21
18. Discovered (18-17)	9/8	1311		000	01	22-26
19. Reported (19-18)	9/8	1312		0	01	27-29
20. First attack (20-19)	9/8	1314		00	02	30-33
21. First reinforcements (21-20)	9/8	1318		00	04	34-37
22. Fire controlled (22-20)	9/9/	1000		020	46	38-42
23. Fire mopped up (23-22)	9/19	1700		247	00	43-47
24. Fire out	9/23	1700		XX	XX	XXX

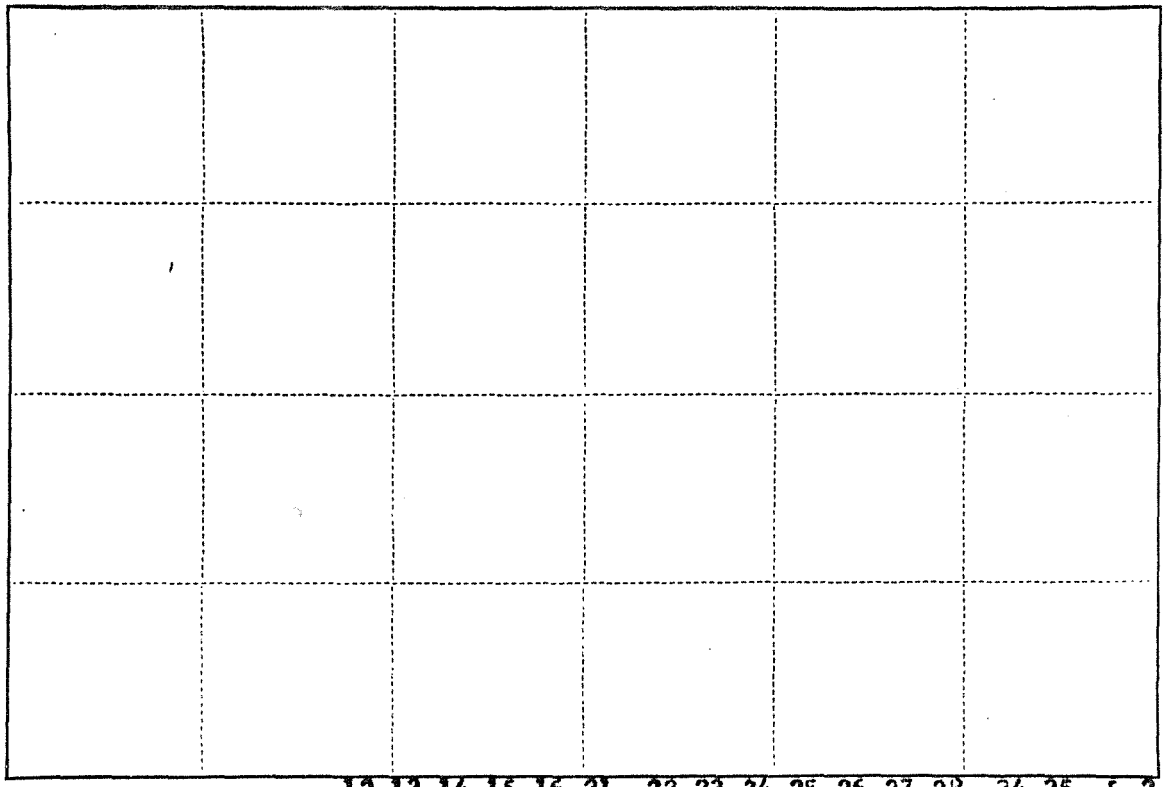
ITEM		CODE NO.	COL. NO.
25. Discovered by	Other (Class of discoverer) County Hwy. Department (Location) Code No. 9		48
26. Reported to	Hwy. Eq. Oper. (Title) Deadwood (Location)	XXXX	XXX
27. Type of first attack	Hand Tools	5	49
28. Number men first attack (Boss ____)	Hwy. Eq. Oper. (Title)	03	50-51
29. Type reinforcement action	Tankers & Pumpers	1	52
30. Number men first reinforcements		99	53-54
31. Danger rating class, or burning index	D.I.	95	55-56
32. Timber type—vicinity point of origin		90	57-58
33. Specific fuels in which fire spread (Origin to attack)		08	59-60

ITEM		CODE NO.	COL. NO.
34. Fuel type prevailing on burned area	ML	05	61-62
35. Man hours to control (In tens)		1346	63-66
36. Man hours to mop-up (In tens)		3204	67-70
37. Character of fire on arrival	Running	3	71
38. Point of origin in feet from outer track of road or railroad (If over 99 feet, disregard)			72-73
39. Slope			74
40. Exposure			75
41. Elevation above sea			76
42. Method of travel			77
43. Distance traveled—miles			78-79
44. Point origin in seen area from 0-1-2-3 L. O. Stations (Occupied ____ Unoccupied ____)			80
45. Line held by tankers or pumpers (Chains)		046	16-18
46. Line built by dozers (Chains)		080	19-21
47. Line built by plows (Chains)		000	22-24
48. Line built by trenchers (Chains)		000	25-27
49. Line built by hand-tools (Chains)		0031	28-31
50. Area when discovered		00	32-33
51. Area when attacked		000	34-36
52. Area when controlled 1871 (N. F. and other inside) (2630 (Outside))		04501	37-41
53. Perimeter in chains when controlled		01624	42-46
54. Perimeter increase in chains per hour discovery to attack		060	47-49
55. Wind velocity at time first attack (____ (Direction))			50-51
56. Wind velocity at time greatest run (____ (Direction))			52-53
57. Danger rating class or burning index at time of greatest run			54-55
58. Maximum number of line workers			56-59
59. Timber type ____ Acres burned ____			60-63
60. Timber type ____ Acres burned ____			64-67
61. Timber type ____ Acres burned ____			68-71
62. Timber type ____ Acres burned ____			72-75
63. Timber type ____ Acres burned ____			76-79
64. Is this fire being reported by the State as its fire?		No	
65. Is this fire being reported to State by any agency for Clarke-McNary record of fires in the State?		No	

MANDATORY ITEMS:
1. Class A: 1-33; 64-65; and Map Record. 2. Class B: 1-36; 45-54; 64-65; Map Record; and 67-68. 3. Classes C-D-E: 1-36; 45-54; 64-65; Map Record; and 67-80.

Form FS 929
(Revised 2-26-51)

MAP RECORD



Twp 4 & 5N R 3E Sec 12,13,14,15,16,21, 22,23,24,25,26,27,28, 34,35, & 2 Mer BH Scale ____ Inches = 1 mile.

SUMMARY OF FIRE DAMAGE

For Class B fires—Lines 67 and 68 mandatory; lines 72 and 79 optional. For Class C and larger fires—all items mandatory.

Objects of Damage	(1) N. F. Lands Total 975 Ac.	Col. No.	(2) Other, Inside Total 896 Ac.	Col. No.	(3) Outside N. F. Total 2630 Ac.	Col. No.
67. Acres noncommercial forest burned	00422	16-20	00388	49-53	00761	16-20
68. Acres commercial forest burned	00253	21-25	00208	54-58	01862	21-25
69. MBM timber destroyed (Convert cords to MBM)	5750	26-29	4875	59-62	18286	26-29
70. Acres young growth destroyed	0100	30-33	0100	63-66	0251	30-33
71. Other timber values (Dollars)		X X X		X X X		X X X
72. Total timber values (Dollars)	20144	34-38	17956	67-71	60195	34-38
73. Watershed damage (Dollars)	54870	39-43	41629	72-75	411631	39-43
74. Recreation damage (Dollars) 45,010	9750	X X X	8960	X X X	26300	X X X
75. Wildlife damage (Dollars) 1,950	487	X X X	448	X X X	1015	X X X
76. Improvements damage (Dollars) 905,000	5000	X X X	40,000	X X X	860,000	X X X
77. Forage damage (Dollars)		X X X		X X X		X X X
78. Other nontimber values damage (Dollars)		X X X		X X X		X X X
79. Total nontimber values damage (Dollars)	70107	44-48	91037	76-80	1298946	44-48
80. GRAND TOTAL damage (Dollars)	90251	X X X	108993	X X X	1359141	X X X

REMARKS:

(a) Date report written 5 (Day) November (Month) 1959 (Year)

(b) By /s/ C.C.H. (Initials (Ranger or acting))

(c) Examined and approved /s/ K.C.S. (Initials (Supervisor or acting))

Exhibit D

FIRE WEATHER RECORDS

Exhibit D

FIRE WEATHER RECORDS
Deadwood Fire, September 8, 1959

September 8, 1964

Station	Temp	Sky Cond	Wind	RH%	PPT	Fire Danger Drought	Fire Danger Spread
Parker Peak	96	2/10	SW 20	11	0	95	40
Sundance	82	4/10	SW 42	14	0	92	90
Nemo	96	Clear	NW 13	11	0	95	20
Custer	91	2/10	S 12	9	0	93	15
Bear Mtn.	85	1/10	SW 16	18	0	89	15

September 9, 1964

Parker Peak	66	Clear	NW 20	20	0	95	25
Sundance	45	Clear	NW 13	45	0	92	25
Custer	62	Clear	N 8	11	0	93	5
Bear Mtn.	54	Clear	NW 8	31	0	89	5

September 10, 1964

Parker Peak	-	-	SE 12	12	0	95	10
Sundance	72	Clear	SW 6	16	0	-	-
Custer	81	Clear	SW 10	8	0	93	10
Bear Mtn.	77	Clear	NE 3	-	0	92	10

Weather Forecast for September 8, 1959 (issued September 7) indicated the following, with comments on what actually occurred:

	Forecast	Actual
Wind	10 or less	10 mph minimum, 42 mph maximum
Temperature	No change	Increased about 10° all stations
Relative Humidity	No change	Lower by 15-20% points
Cloud Cover	1/10	1/10 - 4/10
Precipitation	None	None
Fronts	None	*Front arrived at 1530 hours

*Front was in forecast issued on morning of September 8 - scheduled to arrive at 2:00-3:00 p.m. (Good short range forecast)

U. S. DEPARTMENT OF AGRICULTURE 5120
Forest Service

FIRE DANGER STATION RECORD
Winter Precipitation _____ inches

Forest Black Hills
District Nemo
Station Nemo
Month July Year 1959

Make 2 carbons and send to S.O. and R.O. (Monthly)

1:00 P.M. Measurements								Calculations			Forecast [3]				
DATE	Lightning [1]	Wind		Temperature		Relative Humidity	Precipitation	Fuel Moisture Factor	Drought Index	Rate of Spread Index	Temperature	Wind	Lightning	Drought Index	Rate of Spread Index
		Direction	Speed MPH	Wet Bulb	Dry Bulb [2]										
1		SW	2		70	--	--		58	5					
2		SW	3		66	--	--		63	5					
3		--	--		78	--	--		67	5					
4		--	--		--				70	5					
5		SW	5		73		--		73	5					
6		SW	4		84		--		76	10					
7		NE	5		74		--		78	5					
8		NW	5		66		T		80	5					
9		SW	3		79				82	10					
10		NW	4		73		--		84	10					
11		W	5		70		--		85	10					
12		Calm			75		--		86	15					
13		SE	3		76		--		87	15					
14		--	--		75		--		87	5					
15		SE	4		84		--		89	5					
16			5		76		30		87	5					
17			3		76		30		81	5					
18			4		75										
19		Calm			83		---		75	5					
20		NE	5		79		--		77	5					
21		SW	2		89		--		79	10					
22															
23		SW	4		84		--		82	10					
24		SW	4		88		--		83	10					
25		SW	3		89				84	10					
26		SW	2		84		--		85	10					
27		Calm			78		30		83	5					
28		NE	25		90		.01		66	5					
29		NE	4		72		--		68	5					
30		SE	4		80		--		80	5					
31		E	5		79		--		81	5					

Check Date Used in All Calculations

1 24 hour period ending 1:00 P.M. today
2 Dry Bulb temperature is used in meter calculation
3 Give office of origin

Checked by _____
District Ranger _____
Supervisor's Office _____

R2-5100-42
(7/62)

U. S. DEPARTMENT OF AGRICULTURE 5120
Forest Service

FIRE DANGER STATION RECORD
Winter Precipitation _____ inches

Forest Black Hills
District Nemo
Station Nemo
Month Aug. Year 1959

Make 2 carbons and send to S.O. and R.O. (Monthly)

1:00 P.M. Measurements								Calculations			Forecast [3]				
DATE	Lightning [1]	Wind		Temperature		Relative Humidity	Precipitation	Fuel Moisture Factor	Drought Index	Rate of Spread Index	Temperature	Wind	Lightning	Drought Index	Rate of Spread Index
		Direction	Speed MPH	Wet Bulb	Dry Bulb [2]										
1			3		85		--		82	10					
2		NE	3		85		--		83	10					
3		SW	9		88		--		85	15					
4		Calm			90		--		85	10					
5		Calm			82		--		86	10					
6		E	4		82		--		87	10					
7		SW	4		84		--		88	10					
8		S	6		84		T		89	15					
9		NE	6		82		--		90	15					
10		NE			80		--		90	15					
11			6		95				91.0	15					
12		NE	5		61		T		91	15					
13		NW	7		74	28	--		92	5					
14		NE	8		69	34	--		92	15					
15		SW	8		86	10	--		92	10					
16		W	5		80	20	--		92	5					
17		SE	6		92	9	--		92	10					
18		NE	5		89	17	--		93	10					
19		NE	6		82	39	--		93	10					
20		SE	3		78	55	--		93	5					
21		SE	7		88	24	--		93	10					
22		NE	8		80	30	--		93	5					
23		NE	6		78	31	--		94	5					
24		SE	4		90	21			95	10					
25		N	4		72	34	T		95	5					
26		SE	3		82	18	--		95	10					
27		NW	7		90	11	--		95	10					
28		W	9		93	8	--		95	15					
29		SE	8		80	22	--		95	10					
30		SW	7		74	46	11		95	5					
31		NE	7		76	41			95	5					

Check Date Used in All Calculations

1 24 hour period ending 1:00 P.M. today
2 Dry Bulb temperature is used in meter calculation
3 Give office of origin

Checked by _____
District Ranger _____
Supervisor's Office _____

R2-5100-42
(7/62)

U. S. DEPARTMENT OF AGRICULTURE 5120
Forest Service

FIRE DANGER STATION RECORD
Winter Precipitation _____ inches

Forest Black Hills
District Nemo
Station Nemo
Month Sept. Year 1959

Make 2 carbons and send to S.O. and R.O. (Monthly)

1:00 P.M. Measurements								Calculations			Forecast [3]				
DATE	Lightning [1]	Wind		Temperature		Relative Humidity	Precipitation	Fuel Moisture Factor	Drought Index	Rate of Spread Index	Temperature	Wind	Lightning	Drought Index	Rate of Spread Index
		Direction	Speed MPH	Wet Bulb	Dry Bulb [2]										
Check Date Used in All Calculations															
1		NW	9		65	25	--		95	5					
2		NW	10		66	22	--		95	5					
3		SE	9		74	24	--		95	5					
4		SW	5		90	11	--		95	10					
5		SE	11		84	22	--		95	10					
6		NE	4		74	37	--		95	5					
7		NE	9		78	21	---		95	10					
8		NW	13		96	11	--		95	15					
9		NW	8		60	23			95	5					
10															
11															
12															
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26															
27															
28															
29															
30															
31															

1 24 hour period ending 1:00 P.M. today
2 Dry Bulb temperature is used in meter calculation
3 Give office of origin

Checked by _____
District Ranger _____
Supervisor's Office _____

R2-5100-42
(7/62)

Exhibit E

1955 Agreement

FIRE COOPERATIVE AGREEMENT

1955 Agreement

Exhibit E

F
COOPERATION - Black Hills
Lawrence County

Contract No. 12-11-002-11937
Custer, South Dakota
February 16, 1956

FIRE COOPERATIVE AGREEMENT

THIS AGREEMENT, made this 5th day of December, 1955 by and between Lawrence County, City of Deadwood, City of Lead, Homestake Mining Company, Bald Mountain Mining Company, and Golden Reward Mining Company, all of whom are hereinafter called the Cooperatory, and the Forest Supervisor of the Black Hills National Forest, United States Forest Service of Custer, South Dakota on behalf of the United States for the protection of the Black Hills National Forest and of other lands within or adjoining the National Forest, the protection of which is desired by the Cooperator and that is hereinafter referred to as the Cooperator's lands.

WITNESSETH:

A. The Cooperator Agrees:

1. To deposit with the Regional Fiscal Agent, Forest Service, Denver, Colorado, to the credit of the United States, in accordance with the provisions of Section 5 of the Act of Congress of April 24, 1950 (64 Stat., 83, 16 U.S.C. 572, Supp. V) $0.1332 per acre for all lands and timber holdings within Class A, specified hereafter, in or adjacent to the Black Hills National Forest and shown on the attached map, which is made a part of this agreement. This deposit, amounting to $3095.57 shall be made on or before January 1 of each year and shall be known as the cooperative fund, to be used for fire protection and suppression, but the United States shall not be liable for any damage incident to cooperation hereunder.

2. To furnish the Forest Supervisor each year, prior to May 1, a written description of the lands owned or controlled by him for which the Forest Service is to assume protection responsibilities and a separate list of the lands which are to be excluded from this agreement.

3. To do all in his power to prevent and suppress forest fires and to issue warnings to others, who, through carelessness may start fire in the Forest and, in case he discovers fire burning within or near National Forest land, or within land covered by this agreement, to take prompt action to notify the nearest Forest Officer and to take action to extinguish the fire.

B. The Forest Supervisor Agrees:

1. That the Forest Service will provide fire control for the said lands each year covered by this agreement similar to that given by it to the lands of the United States within said National Forest.

2. To employ all available men and equipment, if necessary, in suppressing all fires on lands embraced within this agreement, all bills for suppression costs to be paid from cooperative funds or Forest Service funds except fires started or caused by the Cooperator or any of his agents or employees, or fires originating at or adjoining residences and due to the carelessness or negligence of the resident thereof.

C. It is mutually understood and agreed:

1. That the County Commissioners of Lawrence County, South Dakota, act as agent for the Cooperator.

2. That the Cooperator's land will be divided into two classes -- Class A, that has a normal fire hazard and does not include ~~land occupied by~~ residences, stores, resorts, camps, or other settlements, and other areas of extra hazard, such as dumps; Class B, all lands of settlements and other extra hazards providing unusual fire hazard.

3. That all lands having a Class B qualification shall be excluded from this agreement.

4. That the Forest Service retains the right to reclassify this land annually for special hazards.

5. That the Forest Service will not be held responsible for fires starting on lands of the Cooperator excluded from this agreement, or at residences or occupied structures.

6. That all lands of the Cooperator included in this agreement and subject to the cooperative payment hereinbefore provided are shown upon plats accompanying its instrument and marked "Exhibit A."

7. This agreement shall remain in force from the date of execution, and if Congress shall make the necessary appropriations it shall continue thereafter from year to year unless terminated in the manner herein provided. Should Congress fail to make such appropriations at any time during the continuance of this agreement, then the obligations of the United States to furnish such service to the said lands of the Cooperator shall cease at the expiration of the period for which appropriations are available. and the Forest Supervisor shall notify the Cooperator.

8. Either party of this agreement may terminate or modify the same at any time upon 30 days' written notice to the other between December 1 of any year and May 1 of the next succeeding year, provided that all obligations such party under this agreement are satisfied.

9. No member of or delegate of Congress or Resident Commissioner shall be admitted to any share or part of this agreement or to any benefit to arise therefrom. (U. S. Revised Statutes, 3739-3742) Nothing, however, herein contained shall be construed to extend to any incorporated company, if the agreement be for the general benefit of such corporation or company.

10. This agreement concels and supersedes that certain agreement date December 15, 1950 (A2fs 10370).

11. It is mutually understood and agreed that moneys deposited under the terms of this agreement by the cooperator may be used by the Forest Service for the payment of necessary indirect costs of administration.

"Document Properly Witnessed"

Exhibit F

1963 FIRE COOPERATIVE AGREEMENT

Exhibit F

1963 FIRE COOPERATIVE AGREEMENT

Note: This 1963 Cooperative Agreement differs from the 1955 Agreement in effect at the time of the Deadwood fire in the following respects:

1. Does not state an exact per-acre fee.
2. Changes date for deposit of suppression fees.
3. Designates that cooperator agent be named to receive fire reports from fires on their land.
4. Encourages prompt action and initial attack by cooperators.
5. Fixes responsibility from damage and suppression costs, resulting from fires started by cooperators.

Exhibit F

1963 COOPERATIVE AGREEMENT

U. S. Department of Agriculture
Forest Service

FIRE COOPERATIVE AGREEMENT

THIS AGREEMENT effective this First day of July, 1963, by and between Lawrence County, City of Deadwood, City of Lead, Homestake Mining Company, Bald Mountain Mining Company and Golden Reward Mining Company, all of whom are hereinafter called the Cooperators, and the Forest Supervisor of the Black Hills National Forest, United States Forest Service of Custer, South Dakota on behalf of the United States, hereinafter called the Forest Supervisor, for the protection of the Black Hills National Forest and the Cooperators' land from fire:

WITNESSETH:

A. The Cooperators Agree:

1. To deposit with the Regional Fiscal Agent, U. S. Forest Service, Building 85, Federal Center, Denver, Colorado, by remittance made payable to Forest Service, U.S.D.A., for the credit of the United States an amount to be determined annually by March 1 on a per acre rate basis for all lands and timber holdings, within Zone "A" as specified hereafter, in or adjacent to the Black Hills National Forest and shown on the map, which is made a part of this agreement The deposit shall be made on or before July 1 of each year to the credit of the cooperative fund account, to be used for fire protection and suppression, but the United States shall not be liable for any damage incident to cooperation hereunder.

2. To furnish to the Forest Supervisor each year, prior to May 1, a written description of the lands owned or controlled by them for which the Forest Service is to assume protection responsibilities.

3. To designate each year the name of their agent to whom the reports of all fires within its operations shall be transmitted by the Forest Officers.

4. To assist the Forest Supervisor of the Black Hills National Forest by furnishing, upon his request, all available men and equipment engaged in their operations either on private or Government land for the suppression of such fires as may occur outside the Cooperators' operations, all expenses for such men and equipment, or any of the Cooperators' supplies used, to be paid by the Forest Service.

5. To instruct their employees or agents to be on the alert for any fire starting in their vicinity, to go to and extinguish it if possible, and if outside the operating area, to report it promptly to the nearest Forest Officer, who will assume responsibility for further action on his arrival.

6. That the money deposited shall remain available to the Forest Service until expended unless this agreement is terminated, in which event the unexpended balance shall be refunded to the Cooperators.

B. The Forest Supervisor Agrees:

1. That the Forest Service will provide fire protection for the said lands covered by this agreement similar to that given by it to the lands of the United States within said National Forest.

2. To report all fires discovered within the Cooperators' operations to the Cooperators' Agent.

C. It is Mutually Understood and Agreed:

1. That the County Commissioners of Lawrence County, South Dakota, will act as agent for the individual Cooperators.

2. That the Cooperators' lands will be divided into two classes - Class A, that has a normal fire hazard and does not include residents, stores, resorts, camps, or other settlements, or other areas of extra hazard, such as dumps. Class B, all lands of settlement and other extra hazards constituting unusual fire hazard.

3. That all lands having a Class B qualification shall be excluded from this agreement.

4. That the Forest Service will not be held responsible for suppression action for fires starting on and confined to lands of the Cooperators excluded from this agreement, or for fires occurring at and confined to residences or occupied structures.

5. That the Forest Service will not be held responsible for the cost of fighting any fires on lands of the Cooperators excluded from this agreement.

6. That all lands of the Cooperators included in this agreement and subject to the cooperative payment hereinbefore provided are shown upon plats accompanying this instrument and marked "Exhibit A".

7. This agreement shall remain in force from the date of execution, and if Congress shall make the necessary appropriations it shall continue thereafter from year to year unless terminated in the manner herein provided. Should Congress fail to make such appropriations at any time during the continuance of this agreement, then the obligations of the United States to furnish such service to the said lands of the Cooperators shall cease at the expiration of the period for which appropriations are available, and the Forest Supervisor shall notify the Cooperators.

8. Either party of this agreement may terminate or modify the same at any time upon 30 days' written notice to the other between December 1 of any year and May 1 of the next succeeding year, provided that all obligations of such party under this agreement are satisfied.

9. No Member of or Delegate to Congress or Resident Commissioner, shall be admitted to any share or part of this agreement or to any benefit that may arise therefrom but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

10. Monies deposited under the terms of this agreement by the Cooperators may be used by the Forest Service for the payment of necessary indirect costs of administration.

11. That the money deposited shall remain available to the Forest Service until expended unless this agreement is terminated, in which event the unobligated balance shall be refunded to the Cooperators.

12. This agreement cancels and supersedes that certain agreement dated December 5, 1955, between the parties hereto, which said agreement shall terminate as of July 1, 1963.

13. Nothing in this agreement shall relieve the Cooperators from legal responsibility for any fire which is started or caused by the Cooperators, or any of its' agents or employees, while acting within the scope of his employment, the full cost of suppression of which will be paid by the Cooperators; as well as the amount of the damage done by any such fire to the lands, timber, or other property of the United States.

"Document properly witnessed"

Exhibit G

COOPERATIVE FOREST FIRE PROTECTION AGREEMENT
BETWEEN
STATE OF SOUTH DAKOTA
DEPARTMENT OF GAME, FISH AND PARKS
AND
NATIONAL PARK SERVICE
AND
UNITED STATES FOREST SERVICE

TITLE 5100 - FIRE CONTROL

COOPERATIVE FOREST FIRE PROTECTION AGREEMENT

BETWEEN

STATE OF SOUTH DAKOTA
DEPARTMENT OF GAME, FISH AND PARKS

AND

NATIONAL PARK SERVICE

AND

UNITED STATES FOREST SERVICE

Purpose:

This agreement is for the purpose of coordinating and expediting fire control activities between the Department of Game, Fish and Parks, the National Park Service, and the U. S. Forest Service, in the Black Hills region of South Dakota, with specific reference to coordinating fire suppression activities during fire emergencies.

Scope:

The agencies, and areas, covered by this agreement are as follows:

1. Department of Game, Fish and Parks, state and privately owned timberlands including Custer State Park.

2. National Park Service including only:

   Wind Cave National Park
   Mt. Rushmore National Memorial
   Jewel Cave National Monument
   Fossil Cycad National Monument

3. United States Forest Service including only:

   Harney National Forest
   Black Hills National Forest

TITLE 5100 - FIRE CONTROL

Definitions:

Benefiting Agency - Agency on whose land the fire occurs.
Cooperating Agency - Agency which has gone beyond its own boundaries to fight fire.

Responsibility:

First and direct responsibility of fire suppression and presuppression rests with the agency administering the lands on which the fire occurs as outlined in this agreement.

Initial action on any fire occurring on the areas covered by this agreement may and shall be taken by the fire organization that first arrives at the scene of the fire, irrespective of administrative boundaries, but the agency taking initial action should endeavor to report the fire immediately to the proper administrative authorities. The agency taking initial action on any fire shall remain on the fire until the fire is completely suppressed or until relieved by the agency responsible for administering and protecting the area on which the fire occurs. The agency responsible for the protection of a given area shall relieve the cooperating agency as promptly as reasonably possible. This includes the release of manpower and equipment insofar as manpower and tools are available.

Initial Attack:

The initial attack on a fire will be made by the crew that arrives on the scene first. In the event that the cooperating agency arrives first, the officer in charge of its crew will serve as Fire Boss until the arrival of the suppression forces or appropriate officer of the agency in whose territory the fire occurs. At such time the Acting Fire Boss will place himself and his crew at the disposal of the officer of the responsible agency, who will then take charge of the fire. The crew making the initial attack, as well as other crews engaged on the fire, will not leave the fire unless and until relieved by the Fire Boss.

Release:

In releasing men and equipment from a fire which is under control, the release of personnel and equipment of the cooperating agency shall receive priority over the release of personnel and equipment of the benefiting agency.

TITLE 5100 - FIRE CONTROL

Equipment, Shortages, and Breakage:

When the cooperating agency's equipment is released from a fire, it shall be the responsibility of the benefiting agency to service, repair and replace shortages. If possible, the cooperating agency's equipment shall be inventoried and shortage or breakage noted at the time the equipment is released from the fire. Insofar as possible, suppression outfits shall be returned complete to the cooperating agency.

Each agency will be reimbursed for the use of heavy fire fighting equipment on a per mile or hour basis. Rates covering operation and repair and depreciation will be established annually by the agencies and made a part of this agreement.

Reimbursement accounts will be submitted promptly after each fire except in those cases on small fires where light equipment such as Jeep pumpers are used for a limited time and involving only a few dollars in costs. These small accounts will be consolidated and submitted for payment at the end of the fire season or when the total amount equals $50.00.

In the event heavy equipment such as a car, truck, tanker or tractor is burned up or damaged to such degree as to require excessive repairs, an investigation will be made by a committee composed of representatives of each agency. This committee will investigate the circumstances in connection with the use and damage of equipment and make recommendations for reimbursement, replacement, or repair.

Inter-Agency Fires:

When fires occurring near the boundaries spread from the territory of one agency into the territory under the administration of the other agency, each agency shall stand its proportionate share of the suppression costs unless special circumstances make some other basis of the division of the cost desirable, in which case they shall be determined by the mutual agreement of the agencies concerned.

Transportation:

Transportation for personnel, equipment, and supplies shall be furnished by the cooperating agency insofar as possible, unless otherwise prearranged. Return of personnel shall be accomplished by the

cooperating agency and if possible the equipment and supplies will be returned at the same time. If it is not feasible to return equipment and supplies at this time, the benefiting agency will furnish the transportation to return such items immediately after all suppressions have been completed.

Hired Transportation Facilities:

Reimbursement for the use of hired transportation facilities, provided by the cooperating agency, shall be made in accordance with the approved current rate for the operation of the vehicles employed, as established by the agency hiring the vehicles.

Reserve Force:

Neither agency will be expected to jeopardize the security of its own area by dispatching all of its available fire protection resources to the fire in the area of the other agency. A reasonable reserve of manpower, equipment, tools, and rations will be retained to adequately safeguard the area at hand.

Reports:

Each agency is responsible for the completion of all necessary fire reports applicable to fires occurring within their respective administrative boundaries. On fires handled cooperatively, the cooperator shall furnish the reporting agency with all available applicable data and in turn the reporting agency will furnish the cooperating agency with copies of all completed fire reports.

Reimbursement for Labor:

The benefiting agency shall reimburse the cooperating agency for services rendered by laborers, foremen, and others who are hired especially for a given fire. Reimbursement in such instances will be made on the basis of the official fire fighters wage scale currently in effect with the benefiting agency. The cooperating agency shall maintain and support its reimbursement claim with adequate time records of services performed.

Insofar as possible, the cooperating agency when authorized or requested to hire fire fighters for use by the benefiting agency shall do so with the understanding that payment for such services shall be made direct by the

benefiting agency to the employee so hired. Record of services performed will be maintained and approved by the hiring agency in these circumstances unless or until actual supervision of the employee is transferred to the benefiting agency.

The cooperating agency shall not request or receive reimbursement for the salaries of regular per annum administrative (non-project) employees unless the cooperating agency supplies labor and supervision at periods or hours outside the prescribed workweek. In such instance the Federal Agency may request and receive reimbursement from the Department of Game, Fish and Parks for the cost in excess of the per annum or per month rate of compensation. When the Federal Agency is the benefiting agency, it will payroll all state employee time outside the basic work day of 8:00 A.M. to 5:00 P.M., Monday through Friday, holidays excepted. State supervisory officers will record and certify such time to the responsible Federal Agency officer for payment at the wage scale agreed upon at the annual fire planning meeting.

Protection Zones:

Because of topography and the land ownership pattern, together with roads and other improvements which change from time to time, the Protection Zones, of the respective agencies will be agreed upon at the annual fire planning conference. These zones will be designated on a map which becomes a part of the fire plan of each agency.

Fires occurring within the above-described protection zones are considered the responsibility of the designated agencies and are subject to the conditions noted before with special reference to subjects contained under the preceding parts pertaining to "Responsibility" and "Initial Attack."

It will be the primary responsibility of the agency upon whose land the fire originates to take law enforcement action. When initial attack is made by other than the responsible agency, that agency will immediately gather information and evidence pertaining to the cause of the fire for the responsible agency.

Request for assistance on all lands outside the designated protection zone boundaries shall be covered by the same terms as prescribed for the benefiting agency under the headings: "Transportation,"

"Hired Transportation Facilities," "Reports," "Reimbursement for Labor," and "Equipment Shortage and Breakage."

Requests for Assistance:

All requests for fire suppression assistance including the use of manpower and equipment shall be made as follows:

Requests for assistance by the Department shall be made by the State Forester or his Assistant, to the Superintendent of Wind Cave National Park and/or Mt. Rushmore National Memorial, or to the Forest Supervisor of the Harney National Forest and/or the Black Hills National Forest, and shall be made in accordance with existing Black Hills Fire Plan.

Requests for assistance by Federal Agencies shall be made to the State Forester or his Assistant, who will dispatch the requested assistance according to procedures set forth in the Black Hills Fire Plan.

It is understood that each fire protection agency will cooperate in assisting other protection agencies in the Black Hills whenever the fire problem on a given area becomes too great to be handled by the protection organization responsible for the administration of the area. Such cooperation will consist primarily of available regular employees for use as firefighters, fire wardens, and other cooperators.

Annually on or before March 1 a meeting of the Regional Director of the National Park Services and the Regional Forester of the U. S. Forest Service and the State Forester will be held at a place mutually agreed upon for the purpose of reviewing the Prevention, Presuppression, and Suppression Plans of the respective agencies and for the purpose of establishing rates for wages and equipment use. Fire Protection Zones will also be discussed at this annual meeting.

This agreement shall continue in force each fire season until amended or cancelled prior to March 1 of any year at the request of one of the cooperating agencies.

(Approved 26 May 1958

Department of Game, Fish and Parks — /s/ Mancel W. Peterson, Chairman

National Park Service — /s/ Emmit Peterson, Director

United States Forest Service — /s/ Howard W. Barber, Regional Director

/s/ Jos. N. Nessel, Acting, Regional Forester

Exhibit H

MODIFICATION OF FIRE COOPERATIVE AGREEMENT

TITLE 5100 - FIRE CONTROL

5176. 1 - Regional Landowner Agreements - Agreement with the HOMESTAKE MINING COMPANY.

A2FS-5074

MODIFICATION OF FIRE COOPERATIVE AGREEMENT

This agreement made by and between the Forest Service, United States Department of Agriculture, by the Regional Forester and the Homestake Mining Company by its General Manager executed by the parties hereto on the date set opposite their respective signatures is for the purpose of amending and supplementing Fire Cooperative Agreement No. A2FS-5074 executed by the parties hereto on the 9th day of July 1943, and to the Modification to paragraph No. 2 on page 1 dated December 12, 1945, and to the Modification to paragraphs numbers 2 and 4 signed June 12, 1951, by the General Manager and June 29, 1951, by the Regional Forester.

It is mutually agreed that paragraph No. 2 on page 1 of the said Agreement of July 9, 1943, and to the Modifications listed above, is hereby amended to read as follows:

> The Company will deposit with the Regional Fiscal Agent, U. S. Forest Service, Building 85, Denver Federal Center, Denver, Colorado, to the credit of the United States 0.1332 dollars per acre for all lands and timber holdings within Zone A as specified above. This deposit shall be made on or before May 1 of each year and shall be known as the Cooperative Fund to be used for fire protection and suppression on lands within the Black Hills National Forest including Zone A lands.

It is further mutually agreed paragraph No. 4 of pages 1 and 2 of said agreement of July 9, 1943, and the 1951 amendment mentioned above are hereby amended to read as follows:

> When action is taken by the Company to suppress a fire not caused by its operation, on land or lands owned by the United States or listed with the Forest Supervisor in Zone A for protection by Regional Forester, exclusive of any lands covered by timber sale agreements, reimbursement will be made to the Company for the fire suppression action. The allowable cost for wages for Company employees will be based upon the following:
>
> (a) Standard fire fighting wage rates approved for the Black Hills National Forest and in effect at the time of the fire plus 17 cents per hour for unskilled fire fighters and semi-skilled fire fighters, smoke chaser, straw boss, crew boss, and sector boss.

(b) Standard fire fighting wage rates approved for the Black Hills National Forest and in effect at the time of the fire for specialized skills, such as bull dozer operators, truck drivers, pump operators, power saw operators, etc.

(c) When government mess if furnished no deduction will be made. Subsistence shall be furnished when the time or duration of the work requires it.

(d) All reimbursements for wages to the Company will be on a straight time basis.

(e) When men are hired by the Company for the sole purpose of fire suppression, they will be paid at the Forest Service rate for fire fighters.

Denver, Colorado June 26, 1956
Forest Service, United States
Department of Agriculture

By: /s/ Donald E. Clark
Regional Forester

Lead, South Dakota May 14, 1956
Homestake Mining Company

By: (signed)
General Manager

A2 FS-5074

MODIFICATION OF FIRE COOPERATIVE AGREEMENT

This agreement made by and between the Forest Service, United States Department of Agriculture by the Regional Forester, and the Homestake Mining Company by its General Manager, executed by the parties hereto on the dates set opposite their respective signatures, is for the purpose of amending and supplementing Fire Cooperative Agreement No. A2FS-5074 executed by the parties hereto on the 9th day of July 1943 and to the modification to paragraph No. 2 on Page 1 dated December 12, 1945.

It is mutually agreed that paragraph No. 2 on Page 1 of said agreement of July 9, 1943 and to the modification of December 12, 1945 is hereby amended to read as follows:

The Company will deposit with the Regional Fiscal Agent, U. S. Forest Service, Denver Colorado to the credit of the United States, $0.0725 per acre for all lands and timber holdings within Zone A as specified above. This deposit shall be made on or before May 1 of each year

and shall be known as the Cooperative Fund to be used for fire protection and suppression on lands within the Black Hills National Forest including Zone A lands.

It is further mutually agreed that paragraph No. 4 of Pages 1 and 2 of said agreement of July 9, 1943 is hereby amended to read as follows:

When action is taken by the Company to suppress a fire, not caused by its operation, on land or lands owned by the United States or listed with the Forest Supervisor in Zone A for protection by the Regional Forester, exclusive of any lands covered by timber sale agreements, reimbursement will be made to the Company for the fire suppression action. The allowable cost for wages for Company employees will be based upon the following:

(a) $1.22 per hour for fire fighters (unskilled).

(b) Standard fire fighting wage rates approved for the Black Hills National Forest and in effect at the time of the fire plus 17¢ per hour for fire fighters (semi-skilled), straw boss,crew boss, sector boss, etc.

(c) Standard fire fighting wage rates approved for the Black Hills National Forest and in effect at the time of the fire for specialized skills such as bulldozer operators, truck drivers, pump operators, etc.

(d) When Government mess is furnished, a deduction of 15¢ per man-hour will be made.

(e) All reimbursements for wages to the Company will be on a straight time basis.

Lead, South Dakota, June 12, 1951 — Homestake Mining Company

By:

/s/ Guy N. Bjorge
General Manager

Denver, Colorado June 12, 1951 — Forest Service, United States Department of Agriculture

By:

/s/ Edward P. Cliff
Regional Forester

TITLE 5100 - FIRE CONTROL

FIRE COOPERATIVE AGREEMENT

This agreement, made this 9th day of July , 1943, by and between the Forest Service, United States Department of Agriculture, by the Regional Forester, hereinafter called the Regional Forester, and the Homestake Mining Company, hereinafter called the Company, witnesseth that

WHEREAS, the Company owns or controls certain tracts of forest lands intermingled with, or adjacent to National Forest lands of the United States and forest lands protected by the United States within or adjacent to the Black Hills National Forest, and

WHEREAS, the existence of forest fires on any of the aforesaid lands jeopardizes the forest and timber on the lands of both the parties hereto, and it is to the mutual advantage of the Regional Forester and of the Company to cooperate in preventing, controlling, and speedily extinguishing all forest fires occurring on any of the aforesaid lands,

NOW, THEREFORE, in consideration of the promises and the mutual promises hereinafter set forth, it is hereby agreed as follows:

1. The Company shall, prior to May 1 of each year, submit to the Supervisor of the Black Hills National Forest an up-to-date list and map of the lands owned by it, to be included within protective zones A and B, as hereinafter defined. The lands to be included in each zone shall be determined by agreement between the parties hereto, and the zones in which each tract is placed shall be indicated on such list and map. Protective zone A shall be comprised of Company lands outside of the Company's operations on which suppression action can best be taken by the Regional Forester. Protective zone B shall be comprised of Company lands within the Company's current operating areas or so situated that the Company employees and organization can best take initial action in fire suppression. Such list and map will be approved each year by the Company and the Forest Supervisor and will become a part of this agreement.

2. The Company will deposit with the Regional Fiscal Agent, United States Forest Service, Denver, Colorado, to the credit of the United States, $0.05 per acre for all lands and timber holdings within zone A as specified above. This deposit shall be made on or before May 1 of each year, and shall be known as the Cooperative Fund to be used for fire protection and suppression on zone A lands.

3. The Regional Forester agrees to employ all available men and equipment, if necessary, in suppressing all fires on land in zone A embraced within this agreement, all suppression costs to be paid from Cooperative Funds or Forest Service funds, except for fires started or caused by the Company, or any of its agents or employees while acting within the scope of his employment with the Company, the cost of suppression of which shall be paid by the Company.

4. When action is taken by the Company to suppress a fire, not caused by its operations, on land or lands owned by the United States or listed with the Forest Supervisor in zone A for protection by the Regional Forester, exclusive of any lands covered by timber sale agreements, reimbursement will be made to the Company for the cost of suppression. When regular workmen of the Company are used for suppression, reimbursement to the Company by the Forest Service will include all labor costs for the firefighters released by the Company. When men are hired by the Company for the sole purpose of fire suppression, they will be paid at the Forest Service rate for firefighters. The suppression of fires on Government lands on which there are timber sales to the Company are covered by clauses in the timber sale agreement and the rate of pay will be computed on the basis therein provided.

5. When the Regional Forester takes action in suppressing fires on Company lands in zone B, the Government will be reimbursed for the actual cost of suppression.

6. When fire occurs involving lands protected by the Regional Forester and zone B lands of the Company, the total incurred expenses will be prorated between the parties, in direct preparation to the area burned that each party is obligated to protect.

7. When action is taken by both the Company and the Regional Forester on lands under other ownership, not listed with the Forest Supervisor for protection, each party hereto will bear its own expense as incurred by it.

8. One individual, and one or more alternates, to be agreed upon mutually by authorized representatives of both the Company and the Regional Forester, will be appointed annually before April 1 to be in charge of suppression activities on large fires involving lands of mixed ownership. This person will have complete charge of suppression action when initial attack has failed to control the fire and 200 or more firefighters are employed. It will be his duty to coordinate the work of suppression crews of both parties.

9. Settlement of suppression costs will be made between the parties hereto each year by December 1 in accordance with the terms set forth in paragraphs numbered 3, 4, 5, and 6 of this agreement.

10. IT IS FURTHER AGREED, That whenever either party is engaged in the suppression of a fire, assistance will be rendered by the other through such means as lending any special firefighting equipment which may be available and, when possible, by making special individuals available on call who may be qualified for such duties as acting in an advisory capacity, as foreman of fire crews, or as operators of specialized equipment. In the event any special firefighting equipment is loaned by either party to the other, the party borrowing such equipment shall be liable for any loss of, or destruction or damage to such equipment, regardless of whether such loss, destruction or damage is caused through carelessness, negligence, or otherwise.

11. Nothing in this agreement shall relieve the Company from legal responsibility for any fire which is started or caused by the Company, or any of its agents or employees, while acting within the scope of his employment, the full cost of suppression of which will be paid by the Company; as well as the amount of the damage done by any such fire to the lands, timber, or other property of the United States.

12. THIS AGREEMENT shall be in full force and effect upon execution by both the Company and the Regional Forester and shall remain in effect until revoked or terminated in the manner provided by paragraph 13 hereof; Provided, that should Congress fail to appropriate money for fire control at any time during the time this agreement is in effect, then the obligations of the United States to prevent and suppress fires on the lands listed by the Company shall cease at the expiration of the period for which appropriations are available and the Regional Forester shall so notify the Company, and the obligations of the Company under this agreement shall likewise cease. In the event this contract is terminated by such failure of appropriation, the unexpended and unobligated moneys previously paid under the provisions of paragraph 2 hereof, shall be refunded to the Company.

13. Either the Company or the Regional Forester may, by written notice to the other, submitted not less than thirty (30) days in advance, terminate this agreement at any time between December 1 of any year and May 1 of the next succeeding year.

14. No Member of or Delegate to Congress or Resident Commissioner shall be admitted to any share or part of this agreement or to any benefit to arise therefrom. Nothing, however, herein contained shall be construed to extend to any incorporated company, if the agreement be for the general benefit of such corporation or company.

TITLE 5100 - FIRE CONTROL

15. This Agreement supersedes the Agreement entered into by the parties hereto on December 12, 1940.

FOREST SERVICE, United States Department of Agriculture,

By /s/ John W. Spencer
Acting Regional Forester

HOMESTAKE MINING COMPANY,

By /s/ Guy N. Bjorge

Title GENERAL MANAGER

Exhibit I

DOCUMENTS AND RECORDS ON FILE

Exhibit I

DOCUMENTS AND RECORDS ON FILE

"Sharp Bits", Homestake Mining Company Publication, September 1960. 36 pp. (Account of Forest Fire)

Rapid City, Daily Journal, September 8, 1959

The Homestake Story. A South Dakota Enterprise, 52 pp. (Story of Homestake Mine)

Air Operations Report, Deadwood Fire; by Ralph G. Johnson

Photographs of Deadwood Fire, 9/8/59 and 9/9/59